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What Is the Potential Impact of Adult Circumcision on the HIV Epidemic Among Men Who Have Sex With Men in San Francisco?

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Abstract

With the help of a community-based survey, we assess the potential effect of circumcision on the HIV epidemic among men who have sex with men (MSM) in San Francisco. Only a small minority of MSM would both derive benefit from circumcision (i.e., were uncircumcised, HIV-negative, predominantly insertive, and reported unprotected insertive anal sex) and be willing to participate in circumcision trials (0.7%) or be circumcised if proven effective as a prevention strategy (0.9%). Circumcision would have limited public health significance for MSM in San Francisco.

Men who have sex with men (MSM) continue to be disproportionately affected by human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) in the developed world and are becoming the center of HIV epidemics in some developing countries.[1] However, evidence-based HIV prevention approaches have not been able to halt MSM epidemics, with HIV incidence resurgent in some countries and newly rising in others.[1,2] A desire to consider adult male circumcision (MC) as a prevention strategy for MSM is driven by its demonstrated ability to reduce HIV incidence by as much as 60% in randomized controlled trials among hetero-sexual men.[3–5]

However, the role circumcision might play in preventing HIV acquisition for MSM is more uncertain than for heterosexual men. Circumcision would only protect the insertive partner during unprotected anal sex, yet many men also engage in receptive anal sex, which confers an approximately 4-fold higher per-contact risk of HIV transmission.[6] This may out-weigh any protective effect circumcision would have for men who assume both sexual roles.[7] A meta-analysis of observational studies showed that circumcision status was associated with a statistically nonsignificant 14% reduction in HIV infection among MSM in the sample overall.[8] A recent prospective cohort study of Australian gay men found that circumcision

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was associated with a reduction in HIV incidence in those men who reported a preference for the insertive role during anal sex.[9] If circumcision were proven to be an effective HIV prevention strategy for primarily “insertive” MSM, several variables would influence if and how it could reduce new HIV infections at the population level. Factors affecting the potential public health impact of a MC campaign within a given population of MSM include the protective efficacy, HIV prevalence, current rates of circumcision, insertive and receptive role segregation, and the willingness of MSM to be circumcised for this indication. In addition, if men are circumcised to reduce HIV infection risk while substantially increasing their risk practices (i.e., risk compensation), any protective effect of circumcision could be diluted, or possibly overwhelmed.[10]

In this report, we use data from the 2008 National HIV Behavioral Surveillance (NHBS) survey for MSM in San Francisco to predict the potential maximum benefit from a MC intervention in this population. NHBS is a Centers for Disease Control and Prevention-coordinated, multicity survey that makes use of time-location-sampling to recruit participants at venues where MSM frequently congregate. Details of the sampling and recruitment procedures have been described else- where.[11,12] Briefly, data were collected from MSM consecutively intercepted at randomly selected venue-day-time periods between July 2008 and December 2008 in San Francisco. Interviewer-administered surveys were conducted with eligible participants (i.e., randomly intercepted at an MSM venue, male sex at birth and currently, age 18 years and older, resident of the Bay Area); data were recorded on handheld computers, and blood samples were collected for HIV antibody testing. In addition to the standard national core measures of demographic and risk behavior information, the local San Francisco questionnaire included questions on the counts of episodes of insertive and receptive anal intercourse with each of up to 5 partners in the preceding 6 months, self-reported current circumcision status (HIV-negative men only), and willingness to be circumcised, if not already. Two 4-point scale (from “Very likely” to “Very unlikely”) items assessed participants’ willingness to (1) participate in a circumcision trial; and (2) be circumcised in the future if evidence supports the efficacy of circumcision in reducing the risk of HIV infection in MSM. To calculate the proportion of men who might hypothetically benefit from a MC intervention, we calculated the proportion of men who were HIV negative, uncircumcised, engaging in predominantly unprotected insertive anal sex, and willing to undergo MC. The study protocol was reviewed and approved by the Centers for Disease Control and Prevention Institutional Review Board and the Committee for Human Research of the University of California, San Francisco.

During the NHBS survey, study staff enumerated 10,279 men attending 117 randomly selected venue-day-time periods and consecutively approached 1520. Of these, 1121 (74%) agreed to eligibility screening; 781 (70%) were eligible; 590 (76%) agreed to participate in the survey and completed the interview. During the interview, 69 men either identified as heterosexual and did not report any male partners in the past 12 months or their electronic data were lost, leaving a sample of 521 unique MSM, who were diverse in terms of race/ethnicity, age, education achievement, and country of birth: 53% were white, 25% Latino, 7% black, and 7% Asian; ages ranged from 18 to 79 years, with a median of 36 years; most men (85%) had some college education or higher.

As seen in Figure 1, in our sample of 521 men, 115 (22.1%) were HIV-positive. Of the 406 HIV-negative men, 327 (80.5%) were already circumcised, leaving 79 (19.5%) for whom circumcision may have an additional preventive benefit. Of these, 17 (21.5%) said they would be willing to participate in circumcision trials for MSM and 22 (27.8%) said they would get circumcised if there were evidence of efficacy. However, to explore the likely size of the population for whom circumcision would be a relevant intervention, we further characterize those reporting unprotected insertive anal intercourse and those willing to be circumcised in a trial or if recommended for prevention. Of the 79 men who were HIV-negative and uncircumcised, 36 (8.9%) reported not using condoms consistently. Notably rates of reported unprotected anal intercourse did not differ between circumcised and uncircumcised men ($P = 0.56$). Four levels of reported frequency of insertive anal intercourse (IAI) were defined as follows: at least 20% of anal sex acts were IAI (i.e., 80% of the time reported some receptive anal intercourse), 40%, 60%; and 80%. Of those HIV-negative men who predominantly engaged in IAI (i.e., ≥80% IAI, unprotected at least some of the time), only 3 (0.7%) were willing to participate in an MSM circumcision trial and only 4 (0.9%) were willing to get circumcised if the evidence from clinical studies found it was safe and efficacious. These estimates do not vary by level of reported IAI; that is, men who engaged in predominantly IAI were as willing to be in a trial or get circumcised as men who were predominantly receptive.

Our community survey results suggest that MC would have limited public health significance for MSM in San Francisco. High existing rates of MC, coupled with low rates of predominant IAI and lack of interest in undergoing the procedure for HIV prevention limit the potential impact of this intervention, even if it were found to be efficacious. Although our results may have limited generalizability, the parameters that affect the utility of circumcision for HIV prevention are not expected to vary greatly among MSM in other US cities. Both national samples of US men and MSM have found similarly high rates of circumcision.[13,14] Moreover, there is little reason to believe that sexual behaviors of MSM in other US cities would differ significantly from that of MSM in San Francisco. Therefore, it may be likely that MC among MSM would have little effect on HIV transmission throughout the United States.

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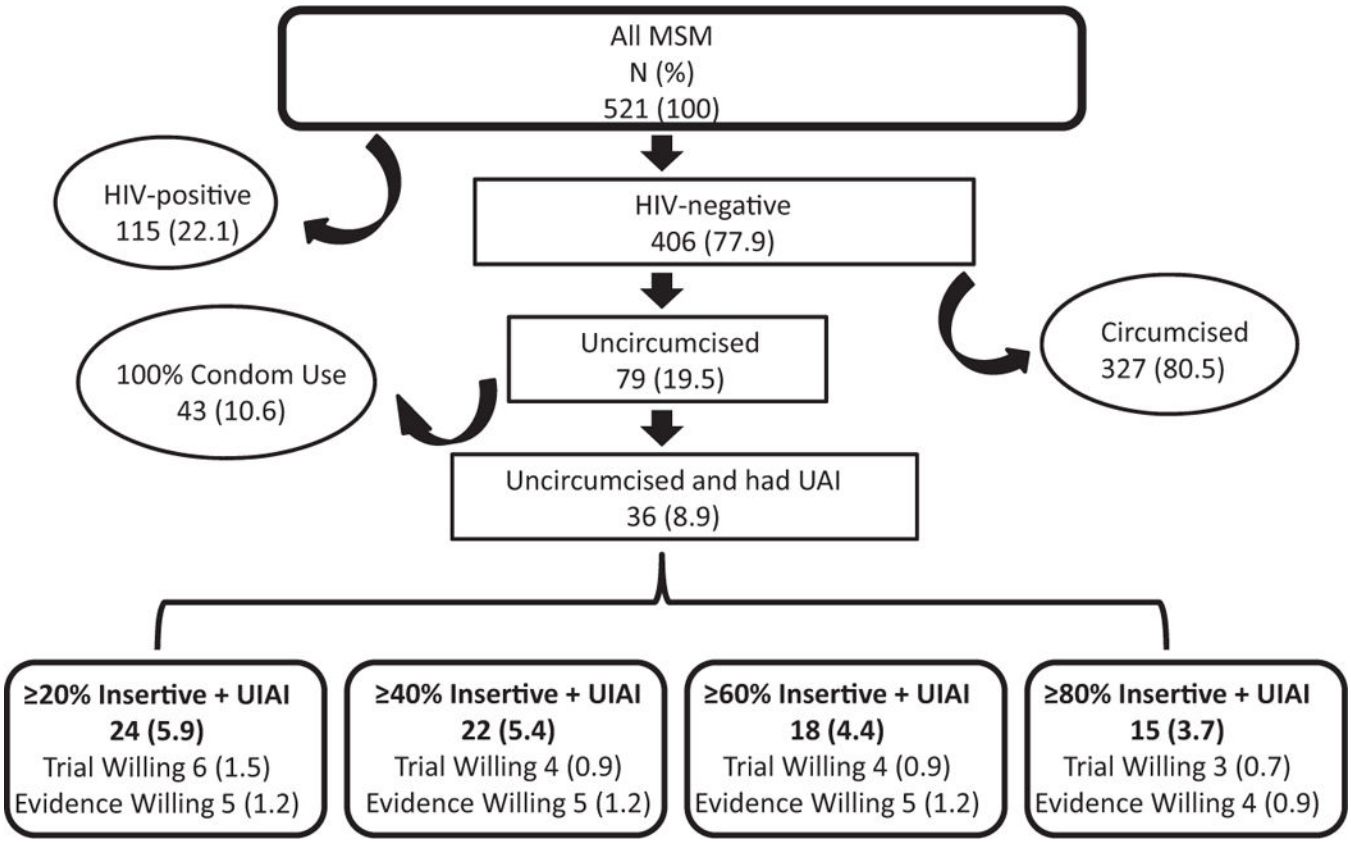

Figure 1.

Circumcision status and willingness to participate in circumcision trials and be circumcised if proven efficacious among MSM in San Francisco. Trial willing indicates willing to participate in a circumcision trial; Evidence willing, willing to be circumcised if scientific evidence supports efficacy of circumcision in preventing HIV; UIAI, unprotected insertive anal intercourse.